

REMARKS

Applicant wishes to thank the Examiner for his helpful suggestions and recommendations during the telephonic interview on November 15, 2001, in which the outstanding rejections and cited patents and printed publications were discussed in relation to the pending claims. As a result, Applicant has amended claims 75 and 90, and added new claims 95-98.

Status of the Claims

Claims 75-94 are pending in the application and stand rejected. Claims 1-74 were previously canceled without prejudice. Applicant amends claims 75 and 94, and adds new claims 95-98. After entry of this Amendment and Response, claims 75-98 will be pending for examination.

Amended Claims

Independent claims 75 and 90 have been amended to remove unnecessary language and to recite that sample supports are transported from an ion source chamber through an output port to a vacuum lock chamber, and vice versa. Support for this amendment to claim 75 is found in the issued patent at least at column 8, line 50, to column 9, line 11, and for claim 90 at least at column 7, line 49, to column 8, line 21. Accordingly, Applicant submits that no new matter is introduced by these amendments

New Claims

Support for new independent claims 95 and 96 is in the issued patent at least at column 4, line 12; column 6, lines 53-57; column 8, lines 21-28 and 40-43; column 8, line 50, to column 9, line 11; column 9, lines 39-45, 53-58 and 61-64; column 10, lines 7-12; and in Figures 6, 7 and 9.

Support for new independent claims 97 and 98 is found in the issued patent at least at column 3, lines 14-17 and 22-34; column 4, lines 12 and 35-38; column 6, lines 44-64; column 7, lines 11-22; column 7 line 37, to column 8, line 21; column 8, lines 53-66; column 9, lines 53-58 and 61-64; column 10, lines 7-12; and in Figures 4-9.

Rejections Under 35 U.S.C. § 112, first paragraph

Claims 75-91 and 93 are rejected under 35 U.S.C. § 112, first paragraph, as allegedly containing subject matter not described in the specification. Specifically, the Office action states:

[i]n the embodiment of figures 6-7 the vacuum lock does not have the capability of storing a plurality of sample plates because it is intended for manual insertion of individual sample plates (column 8, lines 28-33). Thus the embodiment of figures 6-7 cannot provide support for continuous fluid communication between the vacuum lock chamber and the ion source chamber during the full time that the first and second plates are being disassociated, transported and associated. Additionally examiner was not able to find support for placing a storage cassette in the vacuum lock embodiment of figures 6-7.

Office action, page 3.

Applicant respectfully submits that the specification explicitly describes a vacuum lock chamber having the capability of storing a plurality of sample plates using a sample support holder. For example, at column 9, lines 39-45 (cited previously in support of Applicant's claims) the specification discloses:

[a] tested sample plate may be transported from ion source chamber to a vacant slot *in the cassette within the vacuum lock chamber*, and the sample cassette indexed to position another sample plate for transport from the vacuum lock chamber to the ion source chamber, *then* the sample door [is] closed and the new samples on the new plate tested (emphasis added).

See, also, the issued patent, col. 7, lines 5-7, (disclosing that a cassette contains multiple slots for storing a plurality of samples). It is clear from the context of the specification beginning at least at column 8, line 29, that the above quoted portion of column 9 refers to another embodiment of the invention other than those specifically illustrated in Figures 6 and 7. As a result, Applicant submits that the specification of the issued patent expressly supports placing a storage cassette in a vacuum lock chamber. Although Applicant has not provided a separate detailed illustration of every disclosed embodiment of the invention, Applicant submits that in accordance with 35 U.S.C. § 113 the figures in light of the text of the specification do enable one of ordinary skill in the art to understand and practice the subject matter sought to be patented.

In addition, Applicant submits that the specification expressly supports continuous fluid communication between a vacuum lock chamber and an ion source chamber during the full time that a first sample support and second sample support are being disassociated, transported and associated. Specifically, the specification of the issued patent at least at column 9, lines 39-45, shows that continuous fluid communication between a vacuum lock chamber and an ion source chamber can be maintained during the full time that first and second sample supports are being disassociated, transported and associated because a sample door is not closed until after disassociating, transporting and associating has been completed. Accordingly, Applicant submits that pending claims 75-91 and 93 satisfy the requirements of 35 U.S.C. § 112, first paragraph, and respectfully requests reconsideration and withdrawal of this rejection.

With respect to new claims 95-98, Applicant has included a structural limitation to address the above rejection should it be applicable to those claims.

Rejections Under 35 U.S.C. § 112, second paragraph

Claims 75-94 were rejected under 35 U.S.C. § 112, second paragraph, as allegedly being incomplete for omitting essential elements. Specifically, the Office action stated:

[t]he omitted elements are: some sort of control element and since fluid communication and vacuum are specified to be maintained during specific time periods, structure to break or interrupt the fluid communication during other periods. In other words there is structure to isolate the lock chamber from the ion source chamber during certain times which must be claimed in order to be able to control the fluid communication at other times.

Office action, pages 3-4.

Without acquiescing to the rejections, Applicant has amended claims 75 and 90 to remove the clause reciting, "wherein the vacuum lock chamber and ion source chamber are in fluid communication and are maintained under a vacuum controlled environment during disassociation, transportation and association of the first and second sample supports." Accordingly, Applicant respectfully submits that this rejection is rendered moot.

With respect to new claims 95-98, Applicant has included a structural limitation to address the above rejection should it be applicable to those claims.

Rejections Under 35 U.S.C. § 103(a)

Claims 75-81 and 84-94 were rejected under 35 U.S.C. § 103(a) as allegedly being obvious over U.S. Patent No. 5,288,644 to Beavis et al. ("Beavis") in view of "An Automatic Analytical Laboratory for Mass-Spectrometric Isotopic-Dilution Analysis of Uranium and Plutonium in Fuel Solutions" Safeguards Tech., Proc. Symp., 2, pages 165-176 (1970) by Wilhelmi et al. ("Wilhelmi"); U.S. Patent No. 5,382,793 to Weinberger et al. ("Weinberger"), and "Automated Sample Transport System for Chromatography/Secondary Ion Mass Spectrometry," Rev. Sci. Instrum. 60, pages 1071-1074 (1989) by Duffin et al. ("Duffin").

Applicant submits that Beavis, Wilhelmi, Weinberger and Duffin, either alone or in combination, fail to teach or suggest every element of Applicant's claims as well as Applicant's claimed invention as a whole. In particular, with respect to system claims 75-91, Applicant submits that the references fail to teach or suggest

... a sample support transfer mechanism adapted to:

(a) *disassociate a first sample support from the sample receiving stage, ... ; and*

(b) *disassociate a second sample support from the sample support holder, transport the second sample support from the vacuum lock chamber to the ion source chamber and to associate the second sample support with the sample receiving stage; (emphasis added).*

as required by Applicant's pending claims 75-91.

Beavis does not teach or suggest, *inter alia*, any mechanism or means for moving a sample support to an ion source chamber from another chamber or moving a sample support from an ion source chamber to another chamber. Applicant understands the Office action to assert that Weinberger provides the sample transport mechanism which is lacking in Beavis. Specifically, the Office action states that "[i]t would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate . . . [the] transporter mechanism of Weinberger into the Beavis device . . ."

Applicant respectfully submits that Weinberger does not teach or suggest a transport mechanism that can disassociate, transport and associate sample supports as set forth in Applicant's claims. Although Weinberger illustrates disassociating a sample probe (30, 154)

from a sample ring (152) with a push-rod type structure (159), Weinberger's sample probe is not associated with a sample receiving stage in an ion source chamber. Rather, Weinberger's sample probe never leaves the tip of the push-rod until it returns to the sample ring. See, e.g., Weinberger, Fig. 7 and col. 9, lines 5-17 (indicating that probe remains attached to tip of push-rod entire time probe undergoes irradiation). As a result, Weinberger does not teach or suggest a transport mechanism that is adapted to either "disassociate a ... sample support from [a] sample receiving stage," or "associate [a] ... sample support with [a] sample receiving stage" in an ion source chamber as required by Applicant's pending claims 75-91.

Applicant further submits that neither Wilhelmi nor Duffin cure the deficiencies in Beavis and Weinberger. In particular, the apparatus of Wilhelmi does not teach, suggest or motivate a sample support transfer mechanism adapted to associate a sample support with a sample receiving stage in an ion source chamber. Although Wilhelmi states "[f]rom the lock chamber the individual beads are transported separately by a pinch [sic] rod into the ion source for measurement and back to the cassette after measurement," Wilhelmi does not teach or suggest associating a sample with a receiving stage. Wilhelmi, page 171, section 4.1. Rather, Figure 3 of Wilhelmi suggests that the sample remains attached to the push rod. As a result, Wilhelmi does not teach or suggest the transport mechanism required by Applicant's pending claims 75-91.

Further, Duffin does not disclose or suggest any form of sample transport mechanism. Rather, Duffin describes a sample translator. See, e.g., Duffin, Fig. 1 and pages 1072-73. Moreover, even if Duffin's sample translator is considered to teach a sample receiving stage, Duffin provides no teaching or suggestion of any mechanism adapted to disassociate or associate a sample support with a receiving stage, or transport the support to a receiving stage. As a result, Duffin does not teach or suggest the transport mechanism required by Applicant's pending claims 75-91. Therefore, considered as a whole, pending claims 75-91 are novel and unobvious over all of the cited references, either alone or in combination, and Applicant respectfully requests reconsideration and withdrawal of this rejection for claims 75-91.

With respect to method claims 92-94, Applicant submits that Beavis, Wilhelmi, Weinberger and Duffin, either alone or in combination, fail to teach or suggest a method of obtaining mass data including at least the steps of:

disassociating [a] first sample support from [a] sample receiving stage;
transporting the first sample support from [an] ion source chamber to [a] vacuum lock chamber;
associating the first sample support with [a] sample support holder;
disassociating a second sample support from [a] sample support holder;
transporting the second sample support from the vacuum lock chamber to the ion source chamber;
associating the second sample support with the sample receiving stage.

Specifically, for the foregoing reasons discussed for the system claims, the cited references fail to teach or suggest disassociating and associating a sample support with a receiving stage and a sample support holder as set forth in claims 92-94 to produce Applicant's claimed method as a whole. Accordingly, Applicant submits that claims 92-94, considered as a whole, are novel and unobvious over the cited references, either alone or in combination, and Applicant respectfully requests reconsideration and withdrawal of this rejection for claims 92-94.

To the extent the above rejection may apply to new claims 95-98, Applicant submits that claims 95-96 and 97-98 include at least the above distinguishing limitation of pending claims 75 and 90, respectively. Accordingly, because Applicant submits that pending claims 75 and 90 are novel and unobvious over the cited references, Applicant also submits that claims 95-98 are novel and unobvious over the cited references.

Moreover, Applicant submits that the cited references also fail to teach or suggest the limitation,

a means for maintaining the vacuum lock chamber and the ion source chamber in fluid communication and under a vacuum controlled environment during disassociation, transportation and association of the first and second sample supports

as required by claims 95 and 97, and the limitation,

wherein the output port is adapted to maintain the vacuum lock chamber and the ion source chamber in fluid communication and under a vacuum controlled environment during disassociation, transportation and association of the first and second sample supports.

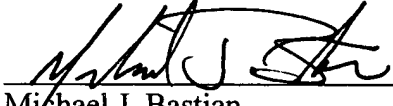
as required by claims 96 and 98. In particular, Weinberger teaches away from fluid communication as claimed because Weinberger teaches a ball valve lock (Figure 6, item number 172) that isolates a sample chamber (28) from a vacuum chamber (22) including his sample ionization region. See, e.g., also Weinberger, col. 9, lines 5-18. Accordingly, Applicant submits that claims 95-98 are novel and unobvious over the cited references.

CONCLUSION

Based on the above amendments, new claims and remarks, Applicant respectfully submits that claims 75-98 are in condition for allowance. If, in the Examiner's opinion, a telephonic interview would expedite favorable prosecution of the present application, the undersigned attorney would welcome the opportunity to discuss any outstanding issues, and to work with the Examiner toward placing the application in condition for allowance.

Respectfully submitted,

Date: November 19, 2001
Reg. No. 47,411
Tel. No. (617) 248-7102
Fax No. (617) 248-7100



Michael J. Bastian
Attorney for Applicant
Testa, Hurwitz, & Thibault, LLP
High Street Tower
125 High Street
Boston, MA 02110

MARKED-UP VERSION OF AMENDED CLAIMS

75. (AMENDED) A system for obtaining mass data comprising:
a mass spectrometer comprising an ion source chamber, wherein the ion source chamber comprises
a sample receiving stage adapted to support a sample support, and
a mechanism to move the sample receiving stage in an x direction and in a y direction perpendicular to the x direction, wherein the x direction and the y direction lie substantially in the same plane;
a laser source in optical communication with the ion source chamber, wherein the laser source is adapted to provide a laser pulse to a sample support in the ion source chamber;
~~a vacuum lock chamber connected with the ion source chamber, wherein the vacuum lock~~
chamber comprises a sample support holder adapted to support more than one sample support;
and
a sample support transfer mechanism adapted to:
(a) disassociate a first sample support from the sample receiving stage, transport the first sample support from the ion source chamber through an output port to the vacuum lock chamber and to associate the first sample support with the sample support holder; and
(b) disassociate a second sample support from the sample support holder, transport the second sample support from the vacuum lock chamber through the output port to the ion source chamber and to associate the second sample support with the sample receiving stage;
~~wherein the vacuum lock chamber and ion source chamber are in fluid communication and are maintained under a vacuum controlled environment during disassociation, transportation and association of the first and second sample supports.~~

90. (AMENDED) A system for obtaining mass data comprising:
a mass spectrometer comprising an ion source chamber, wherein the ion source chamber comprises
a sample receiving stage adapted to support a sample support, and

a mechanism to move the sample receiving stage;

a laser source in communication with the ion source chamber, wherein the laser source is adapted to provide a laser pulse to a sample support in the ion source chamber;

a vacuum lock chamber connected with the ion source chamber;

a sample storage chamber connected to the vacuum lock chamber, wherein the sample storage chamber comprises a sample support holder adapted to support at least one sample support; and

a sample support transfer mechanism adapted to:

(a) disassociate a first sample support from the sample receiving stage, transport the first sample support from the ion source chamber through an output port to the vacuum lock chamber and to associate the first sample support with the sample support holder; and

(b) disassociate a second sample support from the sample support holder, transport the second sample support from the vacuum lock chamber through the output port to the ion source chamber and to associate the second sample support with the sample receiving stage;

~~wherein the vacuum lock chamber and ion source chamber are in fluid communication and are maintained under a vacuum controlled environment during disassociation, transportation and association of the first and second sample supports.~~